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THE DISCOVERY OF AN ANCIENT MESOPOTAMIAN THEORY OF MUSIC

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(*Read November 15, 1968; subsequently revised*)

SOME NINE years ago, the late Benno Landsberger of Chicago's Oriental Institute delivered to the American Philosophical Society a paper dealing with the "Classes and Class Consciousness of Babylonian Society." [1] That study, filled with new insights, was but one of the fruits of his Herculean labors on a corpus of cuneiform tablets and fragments known as the lexical texts. This body of Sumerian and Akkadian material, ranging in time from the third millennium to the very last vestiges of cuneiform writing in the first century B.C., is a rich source for the cuneiformist because it reflects the surprisingly wide range of the scholarly pursuits of the academicians of ancient Mesopotamia. Because Professor Landsberger had devoted a lifetime to their study, he was an unchallenged caretaker of these difficult texts which provided the ancient, as well as the modern scholar, with sign lists, pronouncing vocabularies, bilingual lexicons topically arranged, grammatical treatises and, in brief, reference works of all kinds.[2] It was his intimate knowledge of these texts that caused the total collapse of a theory concerning ancient Mesopotamian music, a theory that had gained a fair recognition by the 1930's.

At that time, a particular cuneiform text[3] containing a list of simple syllables, frequently called "Aameme" after its opening entries, had been interpreted as an ordered collection of notes relating to a scale of three octaves. This text was used to explain the mysterious, marginally written, simple syllables that accompanied certain hymnic literature;[4] these syllables were interpreted as musical notations. Landsberger, however, proved beyond a doubt in an article[5] appearing in 1933 that concerned the "So-called Babylonian Musical Notation," that the "Aameme" text was indeed a *bona fide* lexical text, one, moreover, that was related instead to a comprehensive scholarly collection of personal names. The collection began with shortened names like *A-a*. A subsequent publication in 1959 treating this same genre of lexical text,[6] has served to further his repudiation of the theory of music advanced by Curt Sachs[7] and Francis Galpin.[8]

As far as the Assyriological world was concerned, therefore, we knew nothing about Sumero-Babylonian music, aside from what observations could be made from the pictures of musical instruments, archaeological finds, the many names of instruments not always identifiable, and a veritable sea of Sumerian and Akkadian terms relating to choral and instrumental music. In short, we have been completely in the dark about the theory and practice of that esteemed art whose divine patron was the god of the watery abyss, the god Enki/Ea,[9] always closely associated with magic, with wisdom, and with the arts and crafts.

The past decade, however, has brought to light four single cuneiform texts and a fifth text group that reveal not only the concern of the ancient scribes, or scholars, with musical theory at least

[1] "Observations of a Lexicographer on Classes and Class Consciousness in Sumero-Babylonian Society" (delivered in Philadelphia, Tuesday, April 20, 1961).

[2] For an excellent, though brief, description of these texts, see A. L. Oppenheim, *Ancient Mesopotamia* (Chicago, 1964), pp. 244–248.

[3] *KAR* No. 4.

[4] Collected and discussed in G. A. Reisner, *Sumerische-babylonische Hymnen nach Thontafeln griechischer Zeit* (Berlin, 1896), pp. xvi–xvii. *Cf. CT* 42 (London, 1959), pl. 1, no. 1.

[5] Benno Landsberger, "Die angebliche babylonische Notenschrift" in *Festschrift Max Freiherrn von Oppenheim* (Berlin, 1933), pp. 170–178.

[6] Benno Landsberger, "Zum Silbenalphabet B" in M. Çiğ and H. Kizilyay, *Zwei altbabylonische Schulbücher aus Nippur* (Türk Tarih Kurumu Yayinlarindan VII, Seri No. 35, Ankara, 1959): pp. 97–116 (*cf.* pp. 66–76).

[7] Curt Sachs, "Ein babylonischer Hymnus," *Archiv für Musikwissenschaft* **7** (1925): pp. 1–22 (an elaboration of the same author's "Die Entzifferung einer babylonischen Notenschrift," *Sitzungsberichte der preussischen Akademie der Wissenschaften* **1924**: pp. 120–123).

[8] Francis W. Galpin, *The Music of the Sumerians* (Cambridge, 1937), pp. 43–48 and 99–104; reprinted by Strasbourg University Press, 1955.

[9] In being called (DINGIR.)NAR "the musician (-god)," the little known god Dunga is explained as *Ea ša nārī* "Ea of the musicians" (*CT* 25 (London, 1909), pl. 48, line 10).

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as early as the first half of the second millennium B.C., but that also provide us with the proper names given to the notes on the scale and to certain intervals of the scale. We have learned that, like the Greek word *chordé* meaning both string of an instrument and note on a scale, the Sumerian word s a, and its Akkadian equivalent *pitnu*, likewise stand for "string," "note," and "interval," and may refer to "mode," and "tuning."

The most important or key passage is part of an Akkadian mathematical text in the collection of the University Museum in Philadelphia. The very fact that reference to musical strings should be found in a mathematical context is of interest, because one may see in this a parallel, and in all probability a forerunner, to the importance of the musical string in Pythagorean theory.[10]

The Philadelphia tablet[11] is a list of coefficients relating to a variety of mathematical problems. Whereas lists of this kind are well known for the Old Babylonian period of the early second millennium B.C., the Philadelphia text deviates from the standard format in that it includes material not usually found, and dates, if not to the Kassite period (middle second millennium B.C.), to the Neo-Babylonian (middle to late first millennium B.C.). The second passage is part of a bilingual text from the city of Ur, now in the British Museum.[12] It is part of the encyclopedic work entitled *Nabnītu* ("Creation") which deals with human actions and activities of all kinds; this passage belongs to its 32nd tablet, devoted entirely to musicological terms. The third passage was found in an Akkadian catalog of song titles arranged according to type; it is from Assur, and is now in the collection of the Berlin Museum.[13] In it, the patron god of music, Ea, is mentioned repeatedly in the refrain "May Ea command thy (the singer's) life."[14] These three texts, a mathematical text, a lexical text, and an inventory of songs, gave us our first textual information for a Sumero-Babylonian theory of music.

It was Professor Landsberger, who knew so well his thousands of lines of lexical texts, who first recognized the similarity between the broken section of the lexical text (U.3011) and an obscure passage in the mathematical text (CBS 10996). He brought these two passages to the writer's attention in 1959 in connection with another list of coefficients being studied at the time. In 1960 the two mathematical texts were published in transliteration and translation.[15] The passage dealing with the strings of musical instruments was only a small part of the whole, however, was still imperfectly read, and had received little attention. For my part, only one thing was absolutely certain: that the lines dealing with the musical strings were as valuable as they were obscure. In 1960, the pertinent lines of the mathematical text were rendered as follows:

CBS 10996
Transliteration

Obverse column i (at least five lines broken away at beginning)

	⌜2⌝,⌜4⌝	⌜SA x x⌝-*tum*
	4, 3	SA *kit-mu*
	3, 6	SA *ti*-x *i-šar-tum*
	7, 4	*sa-ti-tum*
10′.	4, 6	*sa-muš-šum*

SA *qud-mu-ú ù* SA 5-*šú* 1, 5 SA *man-ga-ri*
SA 3 *uḫ-ri ù* SA 5-*šú* 7, 5 SA SAR.NIGIN$_2$
SA *ša*-GE$_6$ *ù* SA 4 *uḫ-ri* 2, 6 SA *i-šar-tum*
SA *qud-mu-ú ù* SA 4 *uḫ-ri* 1, 6 SA *šal-šá-tum*
15′. SA 3!-*šú* SIG *ù* SA 3-*šú uḫ-ri* 3, 4 SA *em-bu-bu*
SA *šá*-GE$_6$ *ù* SA 3-*šú uḫ-ri* 2, 4 SA 4-*tu*
SA ^{d}*é-a*-DÙ *ù* SA *qud-mu-ú* 4, 1 SA NIM.MURUB$_4$
SA *qud-mu-ú ù* SA 3-*šú* SIG 1, 3 SA GIŠ.NIM.MA
SA MIN 3-*šú ù* SA *šá*-GE$_6$ 5, 2 SA MURUB$_4$-*tu*

[10] The close association of the study of mathematics and music is also well attested in the Edubba ("Tablethouse") literature; e.g., lines 24 and 27f. of the Old Babylonian bilingual *Examination Text A* (soon to be published by Professor Ake Sjöberg): "(As to the various types of *š* ì r-songs,) do you know how to divide their verses, to recite the antiphon(s) and the finale?" "Multiplication, fractions, to divide an inheritance, to make boundaries in the fields, do you know how (to do all that)?" "(As to various musical instruments and their parts,) do you know how many there are, (or how) to identify them by name?"

[11] CBS 10996. Published by A. D. Kilmer, "Two New Lists of Key Numbers for Mathematical Operations," *Orientalia* 29 (1960): pp. 273–308 with Pl. LXXXIII.

[12] U.3011. The pertinent lines are presented on pp. 264–265 of A. D. Kilmer, "The Strings of Musical Instruments: Their Names, Numbers, and Significance," *AS* 16, pp. 261–268.

[13] Published as *KAR* No. 158. The pertinent lines are presented and discussed by A. D. Kilmer, *ibid.*, pp. 267f.

[14] ^{d}*Ea balaṭka liqbi.*

[15] See footnote 11.

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20′. SA *šá*-GE$_6$ *ù* SA ^{d}*é-a*-DÙ 2, 4 SA x MURUB$_4$-*tu*
SA 4 *uḫ-ri ù* SA 3-*šú* SIG 6, 3 S[A]
SA 3-*šú* SIG *ù* SA 5-*šú* [3], [ ]
SA 3-*šú uḫ-ri ù* [ ]
SA ^{d}*é-a*-DÙ [ ]

(remainder of column broken)

Translation

Obverse column i (five or more lines broken)

⌜2⌝,⌜4⌝ . . . string
4, 3 "covered" string
3, 6 ". . . upright" string
7, 4 "first" string
10′. 4, 6 "second(?)" string
fore string and fifth string 1, 5 "reed basket" string
third-behind string and fifth string 7, 5 . . . string
second string and fourth-behind string 2, 6 "upright" string
fore string and fourth-behind string 2, 6 "third" string
15′. third thin string and third-behind string 3, 4 "flute" string
second string and third-behind string 2, 4 "fourth" string
"Ea-made(-it)" string and fore string 4, 1 . . . string
fore string and third thin string 5, 2 "Elamite" string
. . . string and second string 5, 2 "middle" string
20′. second string and "Ea-made(-it)" string 2, 4 ". . . middle" string
fourth-behind string and third thin string 6, 3 [ ]
third thin string and fifth string ⌜3⌝, [ ]
third-behind string and [ ]
"Ea made(-it)" string [ ]

(remainder broken)

Fortunately, the otherwise completely obscure numeration of the strings as "behind" was elucidated by the lexical text (U.3011) which informs us that nine musical strings are numbered as follows: 1st, 2nd, 3rd-thin, God-Ea-made-it, 5th, 4th-behind, 3rd-behind, 2nd-behind, 1st-behind. Therefore, at least it was clear that, for example, the string called "4th-behind" was the 6th string, and so on. Or, more simply, strings 123456789 were numbered 123454321. The lexical text also contributed, though in broken lines, three of the other terms, namely: *išartu* "upright," or "normal"; "bridge of the *išartu*"; and *kitmu* "cover." The text of U.3011 (*Nabnītu* tablet 32, col. i) is:

	s a . d i	*qud-mu-u*[*m*]	fore (string)
	s a . u š	*šá-mu-šu-um*	next (string)
	s a . 3 s a . s i g	*šá-al-šu qa-a*[*t-nu*]	third, thin (string)
	s a . 4 . t u r	*A-ba-nu-*[*ú*]	Sumerian: fourth, small Akkadian: Ea-creator
5.	s a . d i . *5 (text 4)	*ḫa-am-*[*šu*]	fifth (string)
	s a . 4 . a . g a . g u l	*ri-bi úḫ-ri-i*[*m*]	fourth of the behind (string)
	s a . 3 . a . g a . g u l	*šal-si úḫ-ri-im*	third of the behind (string)
	⌜s a . 2 . a . g a⌝. g u l	*ši-ni úḫ-ri-im*	second of the behind (string)
	[s a . 1] . a . g a . g u l . l a	*úḫ-ru-um*	the behind-one (string)
10.	[9] . s a . a	9 *pi-it-nu*[16]	nine strings
	[ ] x (y)	*pi-is-mu*	. . .
	[ ]	*i-šar-ti*	. . .

[16] In *AS* 16, the writer attempted to collect references to the word *pitnu*, and distinguished between a) GIŠ.NA$_5$ = *pitnu*, (parts of) wooden furnishings, very likely indicating rungs, staves, etc. (p. 262); and b) SA = *pitnu*, the musical string. (The semantic relationship of these two meanings appears to lie in the row of long, narrow strings/staves. Note that the pictograph of the NA$_5$(=ŠA) sign is , perhaps a kind of comb or scraper.) Add the reference x . a d . g i . g a z . z a = *pitnu šá* AD.KID "the *pitnu* of the reed-craftsman" (*Antagal* A 156, see *CAD sub atkuppu*); it may refer to a cutting or smashing instrument. To the discussion of the playing of the *pitnu* (*AS* 16, p. 263) may be added: *ašar* [*it-t*]*a-az-z*[*a-ma-ru pit*]-*nu a-lu-ú* "where *pitnu alû* are sung/played" (*Gilgamesh*) I v 9, see *CAD* A p. 37). (Cannot the *alû* be a stringed instrument?

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	[ ]	[*t*]*i*-⌜*tú*⌝-*ur i-šar-tum*	bridge, . . .
	[ ]	[*ki-i*]*t-mu*	cover
	[ ]	[x y (z) *k*]*i-it-mu*	. . . cover
15.	[ ]	[z y] *-um*	. . .
	[ ]	[x y *-u*]*m*	. . .

(remainder of col. 1 broken)

Even twice blessed with such information, the passages remained elusive, to say the least. Certain observations and corrections of the mathematical text were made, and it was noted that the strings were presented in an orderly sequence from 1 to 7. The fact that the immediately preceding and following sections were broken did not further comprehension. Unfortunately unschooled in matters of music, I could only conjecture that the designated strings described chords on a stringed instrument, and that the chords might be named after other musical instruments according to the sound they produced. But to what purpose I made no guess.

A year or so later, a Belgian musicologist, Dr. Marcelle Duchesne-Guillemin, visited Chicago's Oriental Institute. She heard of the music passage and expressed an interest in discussing it with me. Though we often found ourselves talking at cross purposes, she of musicology and I of Akkadian philology and of the difficulties of cuneiform writing, we managed to compare observations; she rather quickly reached the conclusion that the numbered strings and the names given to the combinations were, indeed, a presentation of the intervals on a musical scale. Moreover, she hypothesized that the lack of numbers above seven, and the fact that the progression turned from seven back to one, indicated a cyclical theory, and that a heptatonic scale underlay the presentation. Dr. Duchesne-Guillemin published her conclusions in 1963.[17]

The writer, convinced of the correctness of much of her hypothesis, though troubled with some of her assumptions on philological grounds, examined the passage in the mathematical text in consultation with Professor Hans Gustav Güterbock of the Oriental Institute, and with Professor Samuel Noah Kramer, curator of the tablet collection of the University Museum. I am happy to say that as a result of Dr. Duchesne-Guillemin's analysis, not only were many readings greatly improved, but we were able to restore the preceding broken section to such an extent that the progression from one through seven and again to one was firmly established. Even though some terms remained untranslatable, it was clear that the names of musical intervals were technical musicological terms. According to Dr. Duchesne-Guillemin's interpretation, the intervals are of fifths, fourths, and thirds, and that much is easily seen in the text, which was now (1965) revised as follows (included here, for the sake of convenience, are several corrected readings which did not become apparent until the discovery of the third text, discussed below):

[17] M. Duchesne-Guillemin, "Découverte d'une Gamme babylonienne," *RM* **49** (1963): pp. 3–17.

CBS 10996 column i

[a. 1, 5	SA *nīš* GAB.RI]
[b. 7, 5	SA *še-e-ru*]
[c. 2, 6	SA *i-šar-tum*]
[d. 1, 6	SA *šal-šá-tum*]
[1. 3, 7	SA *em-bu-bu*]
[2. 2, 7	SA 4-*tu*]
[3. 4, 1	SA ŠUB MURUB$_4$
[4. 1, 3	SA GIŠ.NIM.MA]
[5. 5, 2	SA MURUB$_4$-*tu* (= *qablītu*)]

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6.	⌜2, 4		SA *ti-tur* MURUB$_4$⌝-*tum*
7.	6, 3		SA *kit-mu*
8.	3, 5		SA *ti-tur i-šar-tum*
9.	7, 4		SA **pi-tum*
10.	4, 6		SA *muš*-DU
11.	SA *qud-mu-ú*	*ù* SA 5-*šú*	1, 5 SA *niš* GAB[18].RI
12.	SA 3 *uḫ-ri*	*ù* SA 5-*šú*	7, 5 SA *še-e-ru*[19]
13.	SA *ša*-GE$_6$	*ù* SA 4 *uḫ-ri*	2, 6 SA *i-šar-tum*
14.	SA *qud-mu-ú*	*ù* SA 4 *uḫ-ri*	1, 6 SA *šal-šá-tum*
15.	SA 3-*šú* SIG	*ù* SA 3-*šú uḫ-ri*	3, 7 SA *em-bu-nu*
16.	SA *šá*-GE$_6$	*ù* SA 3-*šú uḫ-ri*	2, 7 SA 4-*tu*
17.	SA ^{d}*É-a*-DÙ	*ù* SA *qud-mu-ú*	4, 1 SA ŠUB MURUB$_4$[20]
18.	SA *qud-mu-ú*	*ù* SA 3-*šú* SIG	1, 3 SA GIŠ.NIM.MA
19.	SA 5-*šú*	*ù* SA *šá*-GE$_6$	5, 2 SA MURUB$_4$-*tu* (= *qablītu*)
20.	SA *šá*-GE$_6$	*ù* SA ^{d}*É-a*-DÙ	2, 4 SA ⌜*ti-tur*⌝ MURUB$_4$-*tú*
21.	SA 4 *uḫ-ri*	*ù* SA 3-*šú* SIG	6, 3 S[A *kit-mu*]
22.	SA 3-*šú* SIG	*ù* SA 5-⌜*šú*	3⌝, [5 SA *ti-tur i-šar-tum*]
23.	SA3-*šú uḫ-ri*	*ù* [SA ^{d}*É-a*-DÙ	7, 4 SA *pi-tum*]
24.	SA ^{d}*É-a*-DÙ	[*ù* SA 4 *uḫ-ri*	4, 6 SA *muš-du*]

(remainder of col. i destroyed)

The more certain changes in the translation of terms were:

lines c, 13: *išartum* "normal"
d, 14: *šalšatum/šalšātum* "a third/thirds"
1, 15: *embūbu* "flute"
2, 16: 4-*tu* (= *rebītu/rebâtu/rebūtu*) "a fourth/fourths/fourth"
5, 19: *qablītu* "middle"
6, 20: *titur qablītu* "bridge, middle"
7, 21: *kitmu* "cover"
8, 22: *titur išartum* "bridge, normal"
10, 24: *mušṭu* "comb(?)"

With the subsequent inclusion of two other terms named in the lexical text, though unknown in the mathematical text, Dr. Duchesne-Guillemin was able to elaborate her discussion of the Babylonian scale and enlarge the little corpus of named intervals. The entire system, in her estimation, has separate names for the octave, for sixths, fifths, fourths, a tritone, major and minor thirds, and possibly for a single whole tone. The names of the intervals differ according to which strings, or "notes" if you will, form the starting and stopping point. She adduces for Mesopotamia a heptatonic scale that is Lydian as to species, supposing a half-tone to lie between the third and fourth strings on the basis of the appellation for the third string as "thin." [21] The interpretations of Dr. Duchesne-Guillemin (*RM* **52** (1966): pp. 160 & 152) were the following (the Akkadian is here slightly revised or corrected):

[18] The cuneiform signs *niš* and *man*, and *gab* and *ga*, are similar in appearance.

[19] See *AS* 16, p. 266 n. 44.

[20] *Cf. AS* 16, p. 266 with n. 49 for the old reading and a hint at the new. NIM.MURUB$_4$ must now definitely be read ŠUB.MURUB$_4$ = *nīd qabli* "fall of the middle" (see footnote 64 below). With little doubt, too, the same "mode" is indicated in the description of thunder in the commentary to the astrological text *Enuma Anu Enlil: Adad rigimšu kīma pitni inaddi*(ŠUB) // *pitnu ša* ŠUB!(looks like DU).MURUB$_4$ "if Adad thunders (lit. 'his noise falls') like a (whole) scale(?) // (that means) a scale(?) of the fall-of-the-middle(-type)" (text cited *AS* 16, p. 263 with n. 19). Note also that this octave-species alone is that named in each repeated summary-refrain of the Hurrian hymn-catalogs from Ras Shamra (discussed below): *annû zam(m)arū ša nīd qabli* "these are the songs of the *nīd qabli* (mode)."

[21] M. Duchesne-Guillemin, "A l'Aube de la Théorie Musicale: Concordance de trois tablettes babyloniennes," *RM* **52** (1966): pp. 147–162 (many points already expressed in her 1963 article; see footnote 17).

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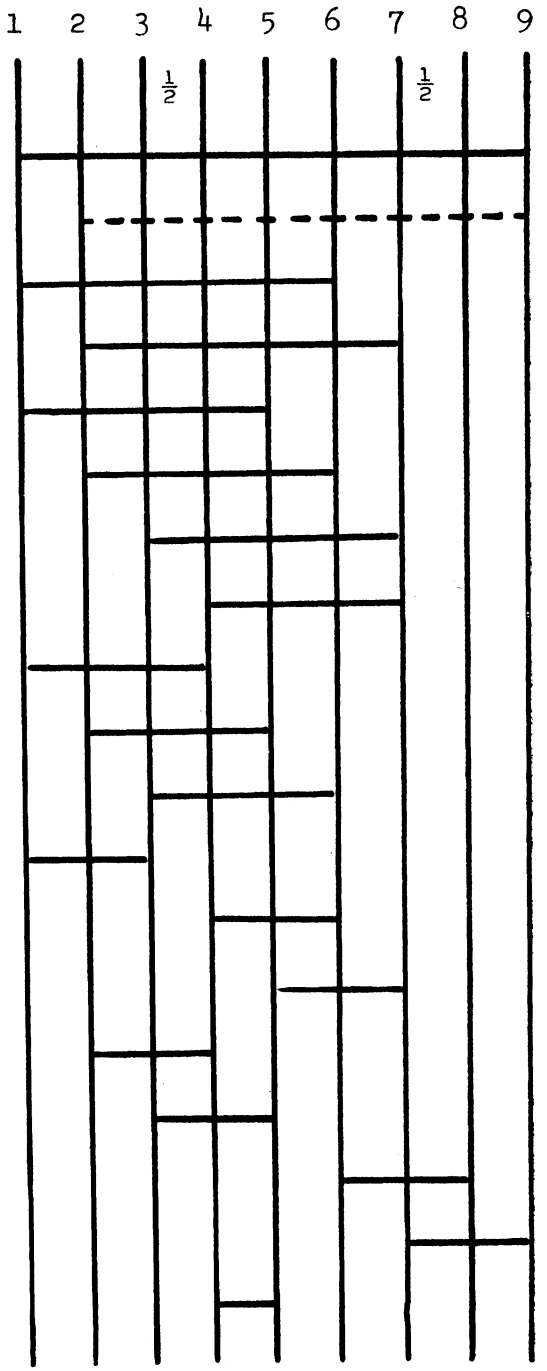
No. of strings		
Nine strings		
Octave (?)	pismu	
Sixths	šalšatum	"third"
	rebūtum	"fourth"
Fifths	nīš GAB.RI	
	išartum	
	embūbu	
Tritone	pītu	
Fourths	nīd qabli	
	qablītu	
	kitmu	
Major Thirds	GIŠ.NIM.MA	
	muštu	
	šēru	
Minor Thirds or Trihemitones	titur qabli	
	titur išartum	
	šalšatum	"third"
	rebūtum	"fourth"
Tone (?)	x-x-x kitmu[22]	



[22] M. Duchesne-Guillemin's rejection (*ibid.*, p. 159) of the restoration [*titur*] *kitmu* on the basis of x x x being one too many signs for the word is not valid for U.3011, which writes *ti-tú-ur* in line 13. For acceptance of a [*ti-tú-ur*] *kitmu*, see below, p. 32.

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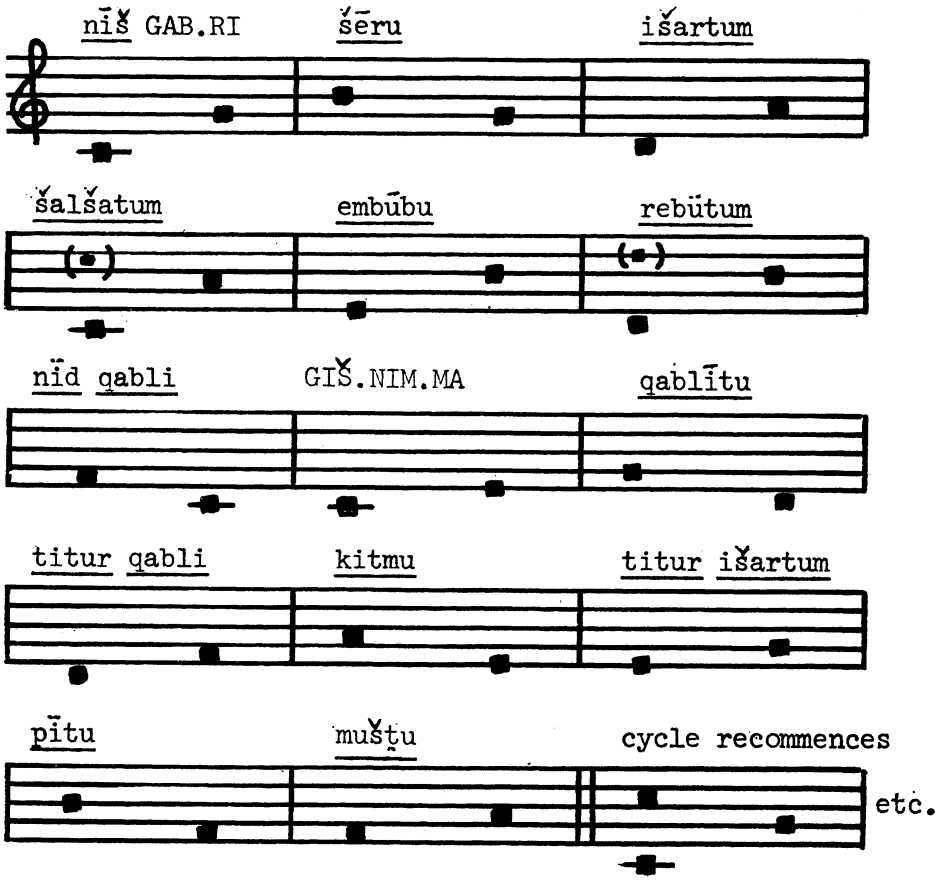

Thus far, our information had come from two mutually elucidating texts that presented the information in list form. We were still without contexts which would establish the application of the hypothesis, and its confirmation. Fortunately, two of the terms used for the intervals led the writer to just such a context.

Among the names that were read with certainty from the outset was the Akkadian word *embūbu*, well known as the name of a flute, and used to describe the interval of a fifth extending from the third string to the seventh. In a rather vigorous effort to find more passages using the same interval names, I had failed, albeit with the help of the exhaustive files of Chicago's Oriental Institute's Assyrian Dictionary project, to locate a single one. I had, of course, in consulting the file cards, repeatedly come across the word *embūbu*, listed as the name of a flute in numerous contexts, together with other named instruments; but lists of instruments were not fruitful for my purposes. One of the references was to a line in a long-known catalog of song titles.[23] The composition appears to have been written in honor of the patron of music, the god Ea.

Another term used to describe the interval of a fifth, extending from the second to the sixth string, was the word *išartu*. This word, an adjective derived from the Semitic root with the meaning "to be straight," was known elsewhere as descriptive of a harp, and had been translated as "upright," for "upright harp." Otherwise, and most commonly, the word means "straight," "normal," "direct," and so forth. Again, aside from its occurrence in lists of instruments, I had vainly searched for the word in a musical context. However, it was true that the word *iš̱artu* may have a variant pronunciation as *iš̱ertu*. This pronunciation happens to be homonymous with another Akkadian word *ešertu*, meaning "holy place," or "shrine." I then remembered that under the word *ešertu* "shrine" had been filed a

[23] *KAR* 158 (see footnote 13).

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card recording a line from the very same catalog of song titles. With high hopes, and a prejudiced assumption, then, that my *išartu* and the catalog's *ešertu* were only variant pronunciations of the same word, and that a meaning "shrine" might be incorrect and thus incorrectly filed, I turned to the catalog itself.

This catalog of various categories of lyrics has a summation in its last column of the total number of different types of songs entered on the tablet. The passage of interest for me listed the total number of "Breast"-songs, that is, love-songs,[24] contained in the inventory. In this seven-line passage, I saw, nearly at a glance, that if several corrections were made in the old transliterations, and if one emendation were allowed, and that if I made certain minor changes in the readings of the mathematical text, here was a duplicate set of seven of the very same names of intervals. This turned out to be not only possible, but correct. Moreover, the seven terms were also arranged in a strict sequence. Once again, an obscure and poorly read passage was elucidated by means of another:

KAR 158 col. viii	CBS 10996 col. i
45. 23 *irātu ša e-šír-te Akkadî* KI	lines c, 13
"23 love songs, of the 'normal' (type), Akkadian"	
46. 17 *irātu ša ki-it-me*	7, 21
"17 love songs, of the 'cover' (type)"	
47. 24 *irātu ša eb-bu-be*	1, 15
"24 love songs, of the 'flute' (type)"	
48. 4 *irātu ša pi-i-te*	9, 23
"4 love songs, of the . . . (type)"	
49. [ ] *irātu ša ni-id* MURUB$_4$	3, 17
". . . love songs, of the . . . (type)"	
50. [ ] *irātu ša ni-*iš* (copy: *i⌜l⌝*) GAB.RI	a, 11
". . . love songs, of the . . . (type)"	
51. [ ] *irātu ša* MURUB$_4$-*te* (= *qablīte*)	5, 19
". . . love songs, of the 'middle' (type)"	
52. [*napḫar* x *irātu Ak-ka-d*]*u-ú*	
"total of x love songs, Akkadian" [25]	

Though the names of the intervals were all read, not all were to be translated with security. In my opinion, the very existence of this duplicate passage, quite unrecognized before Dr. Duchesne-Guillemin advanced her hypothesis, was firm support of a coherent, cyclical theory of music, even if it did not lend itself as proof of the kind of scale in use.

But perhaps more interesting than the still shadowy names of the intervals, is their purpose in a catalog of cult lyrics. The exact context, as given above, must be interpreted as containing descriptions of love songs. Though I had thought only in terms of the different keys in which the songs might be sung,[26] Dr. Duchesne-Guillemin, in a postscript to our joint contribution, suggested that these terms must describe modes,[27] which is obviously more to the point.

She has also paid particular attention to the significance of the numbering of the nine strings as, essentially, 123454321. Whereas I, at the very beginning of my work on the two complementary passages, had thought that the word "behind" might refer to four, perhaps harmonic, strings lying under the first five, she has advanced the idea that a pentatonic scale underlies this numeration, and that the strings called "behind" are, then, the "octaves" of the first four. This is especially attractive, according to her interpretation, because it yields a "perfect symmetry" of tonal composition when one starts at each end of the nine strings and works inward.[28] Only the central, fifth string is left out of the symmetry. She has further attempted to explain the mathematical text's passage as reflecting the point in time at which the pentatonic scale gave way to the heptatonic, that change being the *raison d'être* of the passage. That is, its purpose was the conversion of the string terminology from pentatonic to heptatonic use.

Though I can follow musicological argument only with the greatest difficulty, I am not convinced that her assessment of the purpose of the mathematical text is correct, if for no other reason than the date of the text, which I originally placed in the middle of the second millennium B.C. That would mean that the passage presumably attesting a conversion from pentatonism to heptatonism would be some

[24] Why is the term "breast" used for a love song? Is it because love songs are played on the lyre/harp which is set against the breast when being played?

[25] See Kilmer, *AS* 16, p. 268 with n. 59 (and note already, Langdon, *Jour. Royal Asiatic Soc.* **1921**: p. 187) and correct the *lapsus* in the statement referring to the sequence of intervals in *KAR* 158; it should read: "Just as in CBS 10996 i, seven intervals appear, though here the sequence starts with the second and ends with the *5th*."

[26] Kilmer, *AS* 16, p. 268 n. 60.

[27] M. Duchesne-Guillemin, *AS* 16, p. 272, and *RM* **52** (1966): pp. 154–157.

[28] M. Duchesne-Guillemin, *RM* **52** (1966): p. 162.

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seven or eight hundred years older than the lexical text that expounds the pentatonically based numeration of the nine strings, a serious difficulty at best.

More recently, Dr. Duchesne-Guillemin has directed her efforts toward understanding the Greek terminology for the notes on the scale by means of our Babylonian material, an area that looks rather seductive.[29,30]

As of 1968, the full list of the names of the intervals found in CBS **10996** and *KAR* 158 and their tentative translations was as follows (a-numbers are intermediate or secondary intervals):

1.	*nīš* GAB.RI	"rise/breath of the . . ." [31]
1a.	*šēru*	"morning" (?)[32]
2.	*išartu*	"normal/upright/straight" [33]
2a.	*šalšatu/šalšātu*	"a third/thirds/third"
3.	*embūbu/ebbūbu*	"(name of a) flute" [34]
3a.	*rebītu/rebâtu/rebūtu*	"a fourth/fourths/fourth"
4.	*nīd qablī*[35]	"fall of the middle"
4a.	*elamû* (GIŠ.NIM.MA)	"Elamite" (?)[36]
5.	*qablītu*	"middle"
5a.	*titur qablītu*	"bridge, middle" (or "bridge of the middle")
6.	*kitmu*	"cover" (?)[37]
6a.	*titur kitmu*	"bridge, normal" (or "bridge of the normal")
7.	*pītu*	"opening/open" [38]
7a.	*mušṭu*	"comb" (?)[39]

Since the presentation of this paper in 1968, much new material has appeared, including a cuneiform treatise on the tuning of the harp, some thirty-one fragmentary cuneiform texts, plus thirty-six tiny fragments bearing the same material—all hymn catalogs, and five articles, all of which happily corroborate our findings for the very same terms, and expand productively the musicological interpretations. Typically, the new texts will be seen to have helped to clarify some of the uncertainties that remained.

Still in 1968, Dr. Edmond Sollberger, of the Department of Western Asiatic Antiquities of the British Museum, discovered, in the collection of unpublished Ur tablets, an Old Babylonian (i.e. first half of the second millennium B.C.) fragment of a musical treatise (U.7/80). He turned it over to Professor O. R. Gurney of Oxford, who was keenly interested because he was to publish the *Nabnītu* 32 tablet, U.3011, and because he had been in consultation with the musicologist, Mr. David Wulstan, also of Oxford. Gurney published the tablet as "An Old Babylonian Treatise on the Tuning of the Harp." [40]

This text utilizes the seven primary[41] interval names (1, 2, 3, 4, 5, 6, 7 of our list above), as well as the numbered string names known from CBS 10996 and U.3011, for the purpose of instruction in the tuning of the z à . m í / *sammû* instrument.[42] The process involves changing[43] the strings up or down a semitone in order to obtain the desired "tuning." This text provides additional proof of the heptatonic scale and of the use of the terms for the octave-species. It should be stressed that the age of this text is further evidence for the antiquity of the hepta-

[29] M. Duchesne-Guillemin, "Survivance orientale dans la Désignation des Cordes de la Lyre en Grèce?" *Syria* **44** (1967): pp. 233–246.

[30] The writer wonders why no one has discussed the association (or dissociation) of the Babylonian terms with the Sanskrit names of the alternations of notes on the scale in the Indian system (see the *New Oxford History of Music* (London, 1957), pp. 208 f.): e.g., "fallen" and "not fallen" (*cf. nīdu*); "common" (*cf. išartu*); "middle" (*cf. qablītu*); "hair-fine" (*cf. šalšu qatnu*).

[31] If GABA.RI is for Akkadian *gabarû*, it can mean "opponent" or "duplicate," see *CAD* G; if one may read *qab-ri*, then *qabru* "grave, depth"; also possible is *gab/pru* "strong." The most likely reading, however, is *miḫru*; see now footnote 61.

[32] *še-e-ru* could have other meanings, and it now appears to be a specific technical term. For discussion, see footnote 62.

[33] Note that *išartu* is said of straight (as opposed to slanting) cuneiform handwriting in *Examination Text A*, line 19 (see footnote 10).

[34] *Embūbu* is also the trachea.

[35] For explanation of this reading, see footnote 20.

[36] But see below (with footnote 64) for the corrected reading.

[37] But see below (with footnote 66) for better translation.

[38] The word *pītu* is also the name of a unit of garlic, similar to *gidlu*, or "string," of garlic. See *CAD sub gidlu*.

[39] But see below for corrected reading.

[40] *Iraq* **30** (1968): pp. 229–233.

[41] See D. Wulstan, *Iraq* **30** (1968): p. 216 n. 3.

[42] For the latest argument that the *sammû* is a lyre, see M. Duchesne-Guillemin, *RM* **55** (1969): pp. 10–11.

[43] The technical terms for tightening and loosening the strings were collected in Kilmer, *AS* 16, p. 263 n. 24. For confirmation of U.3011 rev. iii 21′: t u . l u = ne-⌜e/ʾ⌝[-*ú*] "to loosen (strings)" (*Nabnītu* XXXII), see the passages noted by J. Nougayrol in *RA* **61** (1967): p. 190, and see now the comprehensive collection of material on t u . l u by Å. Sjöberg, *Orientalia* **39** (1970): pp. 85–87.

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tonic scale.[44] This fourth text is here presented in translation.[45]

U.7/80 right column

Section I (tuning down the string)

(a). [If the *sammû*-lyre/harp was (tuned as) *pītu*, but]

1. the *embūbu* (interval) [was not clear,]
2. [you altered] the third-thin (string), and thus
3. the *embūbu* (interval) [has become clear.[46]]
4. If the *sammû*-lyre/harp was (tuned as) *embūbu*, but
5. the *kitmu* (interval) [was not clear,]
6. the fourth-behind (=6th string) [you altered, and thus]
7. the *kitmu* has [become clear.]
8. If the *sammû*-lyre/harp was (tuned as) *kit*[*mu*, but]
9. the *išartu* (interval) was not clear,
10. the second and the behind (=9th string) you altered, and thus
11. the *išartu* has become clear.
12. Not augmented (??)[47]

Section II (tuning up the string)

13. If the *sammû*-lyre/harp was (tuned as) *išartu*, [but]
14. you played[48] (lit. "touc*ḫ*d") an ⟨unclear⟩ *qablītu* (interval),
15. you (then) altered the second and behind (= 9th string), and so
16. the *sammû*-lyre/harp was (tuned as) *kitmu*.
17. If the *sammû*-lyre/harp was (tuned as) *kitmu*, but
18. you p[layed] an unclear *išartu* (interval),
19. you altered the fourth-behind (= 6th string) and so
20. [the *sammû*-lyre/harp was (tuned as) *embūbu*.]

(remainder broken)

Mr. Wulstan, in the same issue,[49] provides a comprehensive musicological discussion of the tuning of the harp on the basis of these texts, and also greatly expands the arguments concerning the Babylonian octave-species.[50] Mr. Wulstan reviews the texts and Dr. Duchesne-Guillemin's work, disagrees with her placement of the semitone, with her equation of the Babylonian fourth string ("Ea-made-it") and the Greek μέση, and therefore with her identification of the Babylonian scale as Lydian. Instead, he proposes that the CBS 10996 passage "seems to be a catalogue containing all possible intervals except the tones, semitones, and sevenths," [51] that the Babylonian *qablītu* ("middle") is more likely to be the counterpart of μέση,[52] and that a Pythagorean series of tunings is involved[53] when all the evidence is put together. We here reproduce a portion of Mr. Wulstan's figure 1 (p. 221):

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[44] See remarks above.

[45] For the readings that differ from those of Gurney, see H. Kümmel, *Orientalia* **39** (1970): pp. 255 f. Also see below, footnote 47.

[46] Taking *iz-za-ku* as I_2.

[47] Provisional translation of [x?] NU.SU [y] based on NU = *lā* "not," and SU = *riābu* "to augment, increase, replace," and assuming that this line is a sub-label describing the preceding "Section I." Perhaps to be restored as [SA] NU.SU.S[U] "string(s) not augmented." [Another possibility: NU.SU (for SÙ).U[D] "not embellished" (= *ulluḫu*, see *CAD* E p. 79, *sub elēḫu*.)]

[48] O. R. Gurney (*Iraq* **30** (1968): p. 230) questioned his translation "played" for *talput*; but *lapātu* (TAG) and *lupputu* (TAG.TAG) are well attested as technical terms for playing a stringed instrument. ŠU . . . TAG and DU_{12}(TUKU) are also used. For a recent treatment, see W. H. Ph. Römer, *Sumerische "Königshymnen" der Isin-Zeit* (Leiden, 1965), p. 271 as well as A. Sjöberg, *AS* 16, p. 64 n. 1. Add now H. Kümmel, *op. cit.*, p. 256 n. 1.

[49] David Wulstan, "The Tuning of the Babylonian Harp," *Iraq* **30** (1968): pp. 215–228.

[50] Wulstan's last section (*ibid.*, pp. 226–228) on the "thin string" must be altered with reference to the speculation on an "Elamite invention," since the reading GIŠ.NIM.MA has now been unquestionably discarded. See footnote 64.

[51] *Ibid.*, p. 216.

[52] *Ibid.*, pp. 217 f.

[53] *Ibid.*, p. 220.

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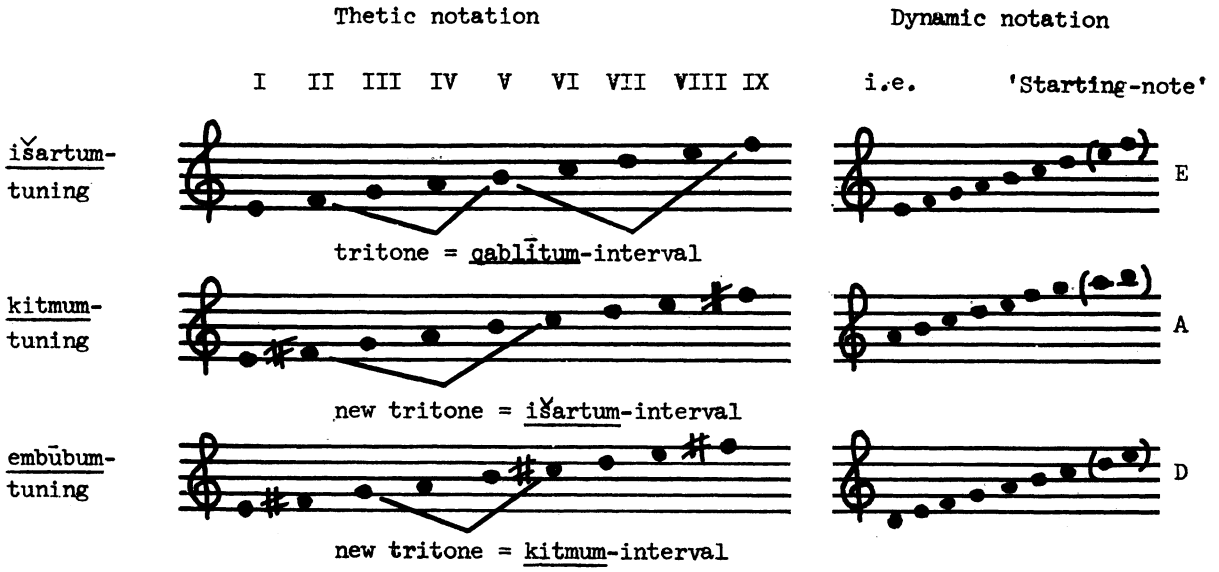
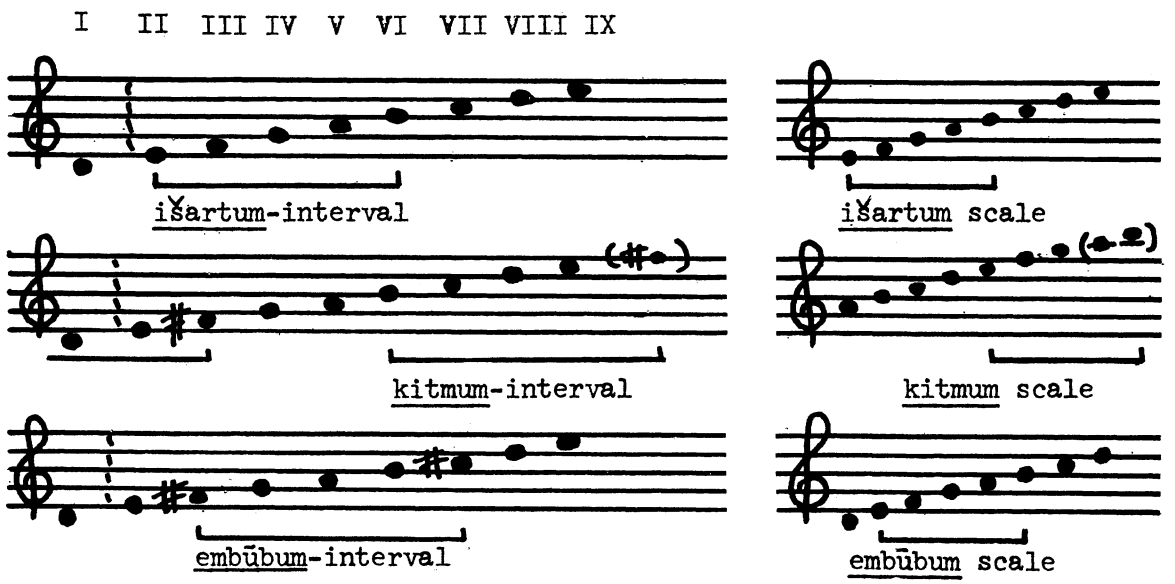


Moreover, he is able to explain by what logic the same terms may stand not only for un-fixed intervals, but lend themselves then to the naming of a specific scale. In his words (p. 222),

> It cannot have escaped the reader familiar with Greek theory that the order of the Babylonian species is the same as that of the Greek species in Ptolemy's System when arranged in the order dictated by their names: Dorian, hypo-Dorian, Phrygian, and so forth. Also, it can be seen that the difference between the left- and right-hand versions of the scales presented above is the difference between the Greek thetic and dynamic nomenclature. If we go further in our analogy of Greek practice and look for the characteristic Dorian segment (E-B) in each of the Babylonian species it is found that this segment is described by the same interval name as its eponymous tuning only on the basis of the thetic D scale postulated on p. 220. In other words, if this scale is accepted as a basic matrix and the 7 species projected on to it, each scale is named by the position of its characteristic segment as oriented on the (thetic) D scale. Thus:



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Lastly, Mr. Wulstan discusses the Harmony of the Spheres, known from Greek theory, as having its origin in the Babylonian ordering of the octave-species.

The two most recent contributions (which were in my hands only after this article was all but finished) come from Dr. Duchesne-Guillemin on "La Théorie Babylonienne des Métaboles Musicales," [54] and from Dr. H. M. Kümmel of Tubingen, in a further article on the tuning of the Babylonian lyre/harp,[55] who sums up the former treatments and offers several convincing independent analyses. But here the writer gives up all pretense of following the musicological arguments, although she has studied the newest philological evidence with the greatest interest.

In an appendix to his article Dr. Kümmel makes the first published, but brief, reference to the most recently discovered group of cuneiform texts that display our same corpus of terms.

Examining his advance copy of *Ugaritica V*,[56] Professor Güterbock made a further discovery. In Prof. E. Laroche's chapter on Hurrian texts,[57] in several fragmentary texts with similar sections divided by rulings, he noted at a glance several words (which, according to Laroche, were unknown Hurrian words) which, if their transcription were altered slightly, were unquestionably the already known Akkadian names of intervals: *kab-li-te*, *ti-tar-kab-li*, *na-at-kab-li*, and *kit-me*. All were followed by unexplained numbers. Here, then, were five of the terms! The other terms, after the ground work had been laid by Dr. Güterbock, and with a few suggestions by the writer, by Dr. Duchesne-Guillemin, and by Dr. Kümmel, have now been recovered and may now be seen to be the same, though in a garbled, barbaric Akkadian, presumably the work of a Hurrian scribe. Especially gratifying is the fact that they help us to correct some of our uncertain readings.[58]

The texts are numbered up to thirty-one, and are composed of many more fragments. Each one appears to be a catalog of Hurrian hymns to gods; after the text of a hymn, a dividing line introduces a paragraph consisting of the known Akkadian musical terms (and a few unknown ones, see below) followed by a number. Apparently, these are the musical directions for the singing or playing of the hymns. For example, R.S. 15.30 + 49 [h.6]:[59]

lines: 1–4. (the words of a hymn, in Hurrian)

5. *qáb-li-te* 3 *ir-bu-te* 1 *qáb-li-te* 2? x x x [*ti-*]*ti-mi-šar-te* 10 *uš-ta-*⌜*ma-a-ri*⌝
6. *ti-ti-mi-šar-te* 2 *zi-ir-te* 1 *ša-*[*a*]*ḫ-ri* 2 x x *-te* 2 *ir-bu-te* 2
7. *um-bu-be* 1 *ša-aš-ša-te* 2 *ir-bu-te* x [*š*]*a-*[*aš-š*]*a-t*[*e*] x *ti-tar-qáb-li ti-ti-mi-šar-te* 4
8. *zi-ir-te* 1 *ša-aḫ-ri* 2 *ša-aš-ša-t*[*e*] 4 *ir-bu-te* 1 *na-ad-qáb-li* 1 *ša-aḫ-ri* 1
9. *ša-aš-ša-te* 4 *ša-aḫ-ri* 1 *ša-aš-š*[*a-t*]*e* 2 *ša-aḫ-ri* 1 *ša-aš-ša-te* 2 *ir-*[*b*]*u-*[*te*] 2
10. *ki-it-me* 2 *qáb-li-te* 3 *ki-it-*[*me*] 1 *qáb-li-te* 4 *ki-it-me* 1 *qáb-li-te* 5?

11. [*an-nu*]*-ú za-am-ma-rù ša ni-id-qib-li za-*[*lu-zi ša* DINGIR.MEŠ TA ^{m}*Ur-ḫi-a*] ŠU ^{m}*Am-mu-ra-pí*
("These are the songs of *nīd-qabli*(-mode), hymns(?) of the gods; from (the collection of the musician) Urḫiya. Copied by Ammurapi (the scribe).")

[54] M. Duchesne-Guillemin, *RM* **55** (1969): pp. 3–11. Duchesne-Guillemin must be assumed to have given up her speculation on the mathematical text CBS 10996 as being the point in time at which pentatonism gave way to heptatonism, since she recognizes the old age of heptatonism (p. 4). She disagrees with Wulstan on many points, especially his use of Greek theory to explain the cuneiform documents, which she considers "un anachronism dangereux" (p. 7). She concludes (p. 10): "Observons, en guise de conclusion à cette analyse, que la gamme de base babylonienne est semblable, compte non tenu du tempérament, à notre gamme de do majeur et que l'ordre des altérations dans les métaboles est le même que celui de nos bémols et de nos dièzes. Est-ce tradition ou coincidence de structure tonale? Le problème reste ouverte."

[55] H. M. Kümmel, "Zur Stimmung der babylonischen Harfe," *Orientalia* **39** (1970): pp. 252–263. Kümmel prefers the term "double stop" to "interval" since he feels that the Babylonian terms "lediglich von der Lage der Saiten innerhalb der Harfe und der Zahl der dazwischenliegenden Saiten ausgehen, nicht dagegen Intervalle akustisch als deren Schwingungsverhältnisse meinen" (p. 252 n. 1).

His explanations (pp. 259 ff.) of the use of the same Akkadian terms for "interval/double stop" on the one hand, and the different "tuning" on the other, which usage became obvious through U.7/80, are ingenious. He feels it is not necessary to explain these phenomena through ancient Greek theory.

[56] Jean Nougayrol *et al.*, *Mission de Ras Shamra XVI: Ugaritica V* (Paris, 1968).

[57] E. Laroche, "Documents en Langue hourrite provenant de Ras Shamra," in *ibid.*, pp. 448–544.

[58] Professor H. G. Güterbock's results will appear in the article "Musical Notation in Ugarit" in a forthcoming number of *RA* **64** (1970). To our chagrin, a few of the same fragments were already published by Laroche in J. Nougayrol, *Mission de Ras Shamra VI: Le Palais Royal d'Ugarit III* (Paris, 1955), pp. 327–335.

[59] *Ugaritica V*, p. 463.

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With the help of these texts, a corrected list of interval/tuning names (but one may doubt that this will be the final redaction!) may be presented:

Standard Akkadian (Sumerian logograms in parentheses)		Barbarized Akkadian forms in *Ugaritica V*	Translation[60]
CBS 10996, *KAR* 158, U.3011, U.7/80	CBS 10996		
1. *nīš miḫri/gabarî* (GAB.RI)		not attested[60a]	rise of the antiphon/ duplicate[61]
1a.	*šēru*	*šaḫri*	(main theme of a) song[62]
2. *išartu*		*išarte*	normal/straight[66]
2a.	*šalšatu*	*šaššate*	third
3. *ebbūbu/embūbu*		*umbube*	(name of a) flute
3a.	*rebūtu*[63] (4-*tu*)	*irbute*	fourth
4. *nīd qabli* (ŠUB[64].MURUB$_4$)		*nid-qabli*[65] (*nad-qibli*, *nid-qibli*)	fall[65a] from/of the middle
4a.	*ešqu/isqu* (GIŠ.ŠUB.BA)[64]	*ešgi*	throwstick/lot
5. *qablītu*		*qablite*	middle
5a.	*titur qablītu*	*titi/ar-*[65]*qabli*	bridge (of/from?) middle
6. *kitmu*		*kitme*	closed[66]
6a.	*titur išartu* (also in U.3011)[67]	*titi(m)išarte*[65]	bridge (of/from?) normal
7. *pītu*		not attested[68]	open[66]
7a.	*ṣ/zirdu*	*zirte*	(meaning uncertain)[69]

[60] *Cf.* footnotes 31–38.

[60a] But cf. footnote 72 with footnote 61.

[61] The most likely reading here is GAB.RI = *miḫru*, usually "equivalent," instead of GAB.RI = *gabarû* "duplicate, opponent," but *miḫru* is to be understood in its well-attested meaning "antiphon, response" as in *miḫir zamāri* (see *CAD sub zamāru*, and *AHw sub meḫru*), even though the usual Sumerian equivalent for *miḫru*, when said of songs, is GIŠ.(GI$_4$.)GÁL. Contrast footnote 72, and see footnote 62.

[62] In Akkadian, the word *šēru* is a technical term describing a particular musical composition: *zamār šēri*. Evidence indicates that it is a composition consisting of (Sumerian) b a l a g and e r š e m m a, since this type of Sumerian composition (vocal, with instrumental accompaniment) is called a *šēru* in an Old Babylonian Istar cult ritual from Mari (see J. Krecher, *Sumerische Kultlyrik* (Wiesbaden, 1966), p. 34 for this reference, as well as for elucidation of the phonetically written hymn incipits in that text). Confusing, but not necessarily conflicting evidence arises from the equation (Sumerian) k i . r u . g ú = *šēru šanû* "to repeat the *šēru*" (see A. Falkenstein, *ZA* NF **15**, 1949, pp. 104 ff.); since long b a l a g compositions (of which the e r š e m m a may only form an introductory section, see Krecher, *op. cit.*, p. 29 with n. 59) are often divided into as many as ten and fifteen k i r u g u 's, one is led to think of that many "repeats" of the major section, called, then, the *šēru*. Because Sumerian r u . g ú as verb is equated with Akkadian *mḫr* (Falkenstein, *loc. cit.*), known to us in the musical context as *miḫru* "response, antiphon" (see preceding footnote), it is tempting to see k i . r u . g ú as "the place (in the song) of the antiphonals," that is, where the main composition, or theme, is repeated, perhaps responsively (by more than one singer, or chorus, with orchestration), perhaps with variations (and in particular octave species?), and where a particular antiphon may be specified and sung. That is, in addition to the notation k i r u g u, there may follow a section in the text with the subscript g i š . g i$_4$. g á l . b i . i m "it is its antiphon" (see Krecher, *op. cit.*, *p.* 32).

Does *šēru*, as the name of an interval, refer, therefore, to the Sumerian "mode" in which the responsive repeats of b a l a g (and other?) compositions were performed? It is probably significant that this word is the name of the interval directly following the *niš miḫri* "rise of the antiphon" -interval.

What is the connection between Akkadian *šēru* and Sumerian š ì r ? The latter seems to be used as a general term for "song," or a specific type of "song," e.g.: [n í . t] e . n i š ì r . r a s i l i m . š è m u . u n . e "(Shulgi) preist sich selbst im Liede" (Shulgi B 9, cited in C. Wilcke, *Das Lugalbandaepos*, Wiesbaden, 1969, pp. 161 f.); it is the base word on which many compounds are made, all names of musical compositions, e.g.:

š ì r . a m a . g a n a	"song of the woman in travail"
š ì r . g a l	"great song"
š ì r . g í d . d a	"long song" (?)
š ì r . ḫ a . m u n	"song for different voices" (?)
š ì r . t é š . g a l	"great unison song" (fn. 77 I)
š ì r . k ù	"sacred song"
š ì r . m á . g u r$_8$. r a	"boat(-man's) song"
š ì r . n a m . g a l a	"song of the *kalû*-priests' craft"
š ì r . n a m . n a r	"song of the musicians' craft"
š ì r . n a m . š u b	"incantation song"
š ì r . n a m . u r . s a g . g á	"song of heroism"
š ì r . r a . n a m . e n . n a	"song of lordship"
š ì r . r a . n a m . n i r . r a	"song of manly valor"

My colleague, Professor Jonas Greenfield, whom I here thank for his assistance on this and several other points, has agreed to contribute the following remarks regarding the relation of Akkadian *šēru* to the Semitic root *š*^{c}*r*: "The Semitic root *š*^{c}*r* relating to poetry and song is found in a variety of forms in the languages of the ancient Near East. In Arabic it maintains its original form and meaning, *viz. ša*^{c}*īr* 'a poet.' But at an early period it underwent in Akkadian the change typical of roots containing a laryngeal, where the loss of ^{c}*ayin* is reflected in the long ē of *šēru*. It may be presumed that Akk. *šēru* 'song' entered Sumerian at this early period and is the source of the common Sumerian word š ì r 'song, poetic composition.'

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The only other term that has been brought into the discussion is *pismu*, from U.3011; Dr. Duchesne-Guillemin has suggested that it may be a term for the octave.[70] As to a further term, [*ti-tú-ur*] *kitmu* of U.3011, posited by Wulstan,[71] there is no corroboration for it, and it may or may not exist.

The Ras Shamra material, then, has brought us several corrected readings, and all but two of the terms are easily found in the Hurrian texts. There are, however, several additional terms found in the same sections, from which one may attempt to find the counterparts of term No. 1 and term No. 7. These terms (most are listed by Laroche on pp. 484 f. in *Ugaritica V*) may be grouped as follows (the texts h.2 to h.5 are in *Mission de Ras Shamra VI*; h.6 ff. are in *Ugaritica V*):

Group I. Compounds made up of known tunings plus the Hurrian words for "high" (*ašḫu*) and "low" (*turi*) and followed by a number:
šaḫri turi
šaḫri ašḫue
irbute ašḫue
irbute turi
zirte turi

Group II. Otherwise unknown terms followed by a number:
ḫap-še-ma Perhaps connect a) with Akkadian *ḫabšu* (see *CAD*): 1. "brittle(?)/wrinkled(?)"; 2. "matted"; 3. "chopped/broken"; 4. "a metal object"; b) with a West Semitic gloss in the El-Amarna letters to ZAG "arm/force" (see *CAD*); c) with Akkadian *ḫamšu* "five"; but this word occurs as name of string, not of interval, in our texts.

Group III. Terms that occur without a number following, and that may directly precede a known term:
pentamma qabli (h.2, h.3, h.25) Connect with Hurrian *pent* "right/straight"? (or, but unlikely, with the word *pītu*?)
pa-ḫi-ta kitme (h.2) ?

As with other culture words, such as Sumerian (h) e g a l > West Semitic *hekal*, š ì r entered the West Semitic languages and is found there as a productive root: noun *šīr* 'song,' and verb *šīr* 'to sing.' The Ras Shamra spelling *ša-aḫ-ri* may be an attempt at realizing the *ᶜayin* behind *šēru*. (*Cf.* W. F. Albright, *Journal of the Palestine Oriental Society* **4** (1924): p. 210 and A. Salonen, *Journal of Near Eastern Studies* **9** (1950): p. 110, on the equation of Heb *šīr*, Ar. *šᶜr*, and Akk. *šēru*.)" [A.D.K.: Unless we are quite misled and should read, instead, *ša uḫ-ri* in the Ras Shamra text! If so, it means "behind," is one of the string names, and we must compare the term *ḫabše* (for *ḫamše* "fifth"?) of the same Ras Shamra text (see below).]

The above appears to prove that the root of Akkadian *šēru* is *šᶜr*, therefore, and not *šḫr* "morning," as frequently thought (see, e.g., *CAD zamār šēri* "morning song").

[63] The Ras Shamra reading *irbute* leads us to conclude that the ordinal *rebūtu* "fourth" was intended, as well as the ordinal *šalšatu* "third" (for *šalušṭu*).

[64] This reading became completely obvious when the Ras Shamra *eš-gi* (= Akkadian *isqu*, *išqu*) could be equated with GIŠ.ŠUB (looked like NIM).BA; since then, all "NIM" signs in CBS 10996 could safely be read as ŠUB. See already Kümmel, *op. cit.*, p. 253 n. 2 and p. 263.

[65] I.e., written in Ras Shamra as a single word.

[65a] Kümmel, *op. cit.*, p. 261 n. 2, suggests that perhaps we should understand the term as meaning a "lowering of the middle." But contrast his remark on p. 263.

[66] The verb *katāmu* is used of the legs as "to close," that is, not walking, and is the opposite of *petû* "to open," said of the legs, walking, as discussed by W. G. Lambert, *Babylonian Wisdom Literature* (Oxford, 1960), p. 291. Therefore, these antonymns, or natural pairs, may well be meant here.

Duchesne-Guillemin's most recent comment (*RM* **55**: p. 8 with n. 1) suggesting that we go back again to *kitmu* = "covered flute" (which never existed!) is completely circular and misses the point; see already *AS* 16, p. 267 n. 54. The same can be said for her insistence (*loc. cit.*) on *išartu* as "upright lyre"; the old translation was only a guess, after all, and our technical interval term may just as well be used to describe the particular lyre (the lexical passages for which the guess "upright" was first made, by Landsberger, are cited in *CAD sub išartu* and in *AHw sub ḫarru*).

[67] Note that only CBS 10996 and U.3011 use this "secondary" interval name, and that U.3011 is unique (thus far) in its terminology since it may continue, as Wulstan suggests (*op. cit.*, p. 224), with [*ti-tú-ur*] *kitmu*, otherwise unattested. See below and footnote 22.

[68] It seems that it must be there, but in what form? See below.

[69] Though the reading (MUŠ and ṢIR are the same cuneiform sign) is now certain, the same cannot be said for the meaning; some possibilities (see *CAD*) are: (1) *ṣīrtu* "first rank"; (2) *zirti* "weak" (?) (a West Semitic gloss in the El-Amarna letters); (3) *zērtu* "plaited"; (4) *serdu* "olive tree" should be out of the running, since the MUŠ sign is not used for *sir*, but only *ṣir/zir*.

[70] See *AS* 16, p. 264 n. 30 and p. 271; *RM* **52** (1966): pp. 158 f.

[71] D. Wulstan, *Iraq* **30** (1968): p. 224. *Cf.* footnotes 22 and 67 above.

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The question is whether these are to be understood as compounds, or whether the terms *pentamma* and *pa-ḫi-ta* stand alone, without a number. *Cf.* the sequence *nadqabli titarqabli* 2 in h.21, and [*i*]*šarte pu*[*garnu*] in h.26. I believe that we may not exclude, therefore, the terms that seem to stand alone, without numbers, from the names of intervals. The following group is of that type:

Group IV. Terms without numbers following, or with following numbers not preserved:
e-ta-m[*a*]
be-ni-in-ni-ma (follows *azzamira*, see below)
pu-gàr-nu
*im*ʔ*-za-aḫ*
mi-iš-[ ]
ud-ga-[ ]
ḫi-za-w[*e*]
ka-za-e [ ]
še-a-ni ak-ki-im

Group V. Terms that are Akkadian (i.e., not Hurrian, see Laroche p. 486):
an-nu-ú za-am-ma-aš-ša Read instead: *annû za-am-ma-rù ša nīd-qabli* "these are the songs of the 'fall of the middle(-tuning).' "

Group VI. Words that may be Akkadian:
az-za-mi-ra Do not connect (as does Laroche, p. 484) with Hurrian *azzami* "figurine," but read instead: *a*(*z*)*zammira* "I will sing" from *zamāru*?
uš-ta-m/ba-a-ri[72] Connect with Akkadian *marû* "to be slow"? If so, for *uštamarri* "I make/incant (i.e., the songs according to the particular instructions) slowly." (III_2 pres.) Or, connect with Akk. *šutabrû* "to prolong, make long-lasting," hence *uštabarri* "I prolong (the singing)," and *cf.* the bilingual passage describing a festival, IV R 18 no. 1, lines 20 f.: [. . .] š à . g ù . d é . b i . t a u$_4$. g e$_6$. b i m i . n i . i n . [z a l] = [. . .] *ni-gu-ta mu-šu u ur-ra uš-ta-ba*[*r-ri*] ". . . the music, day and night, he prolongs."
ak-ki-im Connect with Akkadian *ekēmu* (see *CAD* E p. 67), thus "I will shorten/take away"?
za-lu-zi The translation "hymns" is a guess. Though it seems to look like a Hurrian word (**saluzze*?), perhaps it is to be connected with Akkadian *salû/sullû* "to pray," hence "prayer/hymn," but what form should it represent?

A typical passage (here artificially conflated for the sake of illustration) would then be:
(words of hymn)

---

a(*z*)*zammira beninnima*[73] [ ]
qablite 3 *irbute* 1 . . . *titimišarte* 10 *uštab/mari*
šaššate 4 *šaḫri* 1 *šaššate* 2 *šaḫri* 1 *šaššate* 2 *irbute* 2

---

annû zam(*m*)*arū ša nīd-qabli zaluzi* DINGIR.MEŠ . . .
"I will sing the . . .
middle(-interval) 3(-times?), fourth(-interval) 1(-time?), . . . bridge of the normal(-interval) 10(-times?) I do slowly(?);[74]
third(-interval) 4(-times?), 'song(?)'(-interval) 1(-time?), third(-interval) 2(-times?), 'song(?)' (-interval) 1(-time?), third(-interval) 2(-times?), fourth(-interval) 2(-times?).

These are the songs of the *nīd-qabli*(-tuning); hymns(?) of the gods . . ."

[72] To see in this writing the barbarized counterpart of *nīš gabarî* would require an overly audacious emendation to *uš-*ga-*ba-a-ri* (*ga* and *ta*, and *ba* and *ma* may so often look alike); *nit-ta-ba-a-ri* would be another.

[73] If Akkadian, one might think of a form like *biniannu* (see *CAD*) "form, figure."

[74] If this were correct, then some of the lines include an indication of tempo.

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It should be noted that, just as the *KAR* 158 catalog utilizes our terms for Akkadian songs exclusively, and very likely only for love songs, the Ras Shamra texts appear to fall into the same category, *viz.* Hurrian "hymns" that are cult love songs. Note that the Hurrian contexts of the hymns refer to several goddesses, to Ḫebat, the consort of Teshub, and to "love," "heart," "maiden," "sister," "gifts," and other such topics.[75]

If it could be true that these Ras Shamra texts provide instructions for singing the lyrics, then we would have our first lead as to how our ancient music might have sounded. It will be interesting to see what the musicologists will do with these new pieces of information.

For my Assyriological part, I plan to continue the study of the song catalog, eager to learn whether the many other terms, Sumerian and Akkadian, used to describe the various categories of hymns and songs, may also hide among them technical musicological terms. My study has thus far yielded only three other pertinent lines, again relating to Akkadian, not Sumerian, songs. But here the primary interval terms refer not to love songs, but to another category of song:

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[75] Though it is true that one can be over-enthusiastic, it is just possible that another very obscure and very broken group of Ras Shamra texts relating to the goddess' cult, written in the Ugaritic alphabet, and deemed "Akkadian?" might contain musicological material similar to that discussed in this paper. Not disregarding the heroic efforts of E. Dhorme to read them in Akkadian (*RA* **37** (1940): pp. 83–96), we may have a West Semitic text containing the Akkadian music terms [*UT* = Cyrus H. Gordon, *Ugaritic Textbook*, Analecta Orientalia **38** (3v., Rome, 1965); Herdner = A. Herdner, *Corpus des Tablettes en Cunéiformes alphabétiques découvertes à Ras Shamra Ugarit de 1929 à 1939 = Mission de Ras Shamra X* (Paris, 1963)]:

UT 104 = Herdner 163:	1. *ḏmr kblt ni* [ ] √*zmr qablītu* . . . "songs, middle(-tuning) . . ."	instead of Dhorme's (pp. 89, 91 f.)	*z₂mrk bltni* [ ] *zamrâku bêletni* "je chante notre dame . . ." [ADK note: stative I sg. doubtful]
	3. *nll irbt ryb* [ ] √*ʾll irbūtu* √*riābu* . . . "(to exclaim), fourth(-tuning), (to augment)"	"	*nll irbt ryb* [ ] *ina lîli erbêti rîba* . . . "le soir tu entres au couchant . . ." [ADK note: stative II sg. doubtful]
	4. *taḏmr mᶜnh w* [ ] √*zmr* √*ᶜnī/ū* . . . "you sing its response"	"	*taz₂mr mᶜnh w* [ ] . . . *azamur mᶜnh* . . . ". . . je chante. Son répons: . . ." [ADK note: √*ᶜnī/ū* "to answer" is not attested in Akkadian. For its use in Heb. and Ugar. as "responsive singing" see the note of F.I. Andersen, *Vetus Testamentum* **16** (1966): pp. 108–112.]
	6. *mṯykltmk ktm* [ ] . . . . . *kitmu* . . . ". . . closed(-tuning)"	"	*mš₂ty klt mkktm*[*t*] . . . *mušîti kallate mukkatimti* . . . "de la nuit, fiancée voilée . . ."
	7. *bt ryb ḏmr ky*[ ] *pītu* √*riābu lzmr* . . . "open(-tuning), √*riābu*, for singing(?) . . ." [Note: *pītu* possible only if Hurrian scribal habits apply]	"	*bt ryb lz₂mrky* [ ] *-bêti rība luzmurki* . . . "tu entres au couchant. Je te chanterai . . ."
UT 103 = Herdner 162:	21f. *pḫt ʾinm(t)* [ ] [connect with Ras Shamra *pa-ḫi-ta* ?] . . .	"	*pḫt nmt* [ ] *-pḫat ina mâti* . . . "elle se lève dans le pays . . ."

My colleague, Jonas Greenfield, with whom I have discussed these texts, has expressed the opinion that my suggestions are plausible.

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KAR 158

v 16 (= viii 14)	13?*šiṭru ša ebbūbe Akkadî*
viii 15	2 KIMIN *ša pīte Akkadî*
	13 *šiṭru*[76]-songs, of the "flute (-tuning)," Akkadian
	2 DITTO, of the "open (-tuning)," Akkadian

Unfortunately, the context of songs is poorly preserved in the body of the text; but some are songs of praise for a god, lord of wisdom.

One of the terms used for a secondary interval, *šēru*, also appears in the summation section of *KAR* 158 viii 19:

napḫar 11 *zamār šēri* "total: 11 *šēru*-songs

but the fact that it is used in construct formation, with *zamār*, and that no word *ša* "of" appears, suggests that no tuning or mode is indicated; rather, we have only a type of song whose context is not preserved (the line following is the same: 11 *zamār alalî Akkadî* "11 work-songs, Akkadian").

Of all the song categories in the catalog, there are eight different songs of Sumerian type, five others that may be Sumerian or Akkadian, and seventeen different Akkadian types. Of all these, only two of the Akkadian song types are supplied with the "modes," *viz.* the *šiṭru*-type and the *irtu*, or love-type. My guess is that the Sumerian terms in particular should also provide us with information relating to a theory of music.[77] But unless we can find another tablet like the Philadelphia tablet, I am afraid that we shall be unable to understand their significance. One must also wonder how far back in time the

[76] Doubtless from *šaṭāru* "to write," *šiṭru* "writing"; but what should it mean here? Is *šiṭru* in an Old Babylonian Mari cult ritual (G. Dossin, *RA* **35** (1938): pp. 1–13, col. i 10 and col. iv 9, 27, 32) to be compared? There the context is an elaborate purification/dedication ritual done to instrumental music and Sumerian songs (but called by the Akkadian term *šērum*) of various types, sung by the *kalû* "cult singer." *Cf.* footnote 62.

[77] In *AS* 16, p. 265 n. 34, I mentioned the rather obscure Sumerian musicological term t i g i . 7, and the possibility of its connection with the heptatonic scale; does it mean "instrumental music in the heptatonic scale"? Here may be added several passages exhibiting the seven chief instruments playing in unison, several t i g i . 7 passages, other pertinent t i g i passages, and another passage that may reveal the importance of the number seven in Sumerian music in general.

I. The Seven Instruments

Eridu Hymn (*Enki's Journey to Nippur*) [*cf.* S. Langdon, *American Journal of Semitic Languages and Literatures* **39** (1922/23): pp. 161 ff.], lines 62–67:

^{giš}zà.mí ^{giš}al.gar balag liliz.za
^{giš}ḪAR.ḪAR ^{giš}sa.bi.tum ^{giš}mi.rí.tum é.si.ga
ad.du$_{10}$.ga nundum?.búr.e balag.gá
šà.ní.ba.ke$_4$ ad ḫa.ba.ni.ib.ša$_4$
^{giš}al.gar.kù ^{d}en.ki.ke$_4$ní.ba mu.na.an.du$_{12}$ nar.imin(.7).e ad ḫé.im.mib.ša$_4$

"the *sammû*-lyre, the *algar*-harp, the *balaggu*-instrument, the *lilissu*-drum,
the *ḫarḫarru*-strings, the *sabītum* (and *mīritum* (-stringed instruments), filling the temple,
in good sound, *releasing the lips* (?) of the b a l a g composition,
in its own midst let it (= the music) resound;
let the holy *algar*'s play together for Enki;
let the seven musicians cause a resounding thereupon."

Note that H. Hartmann prefers the reading t i g i (NAR.BALAG) in the line 67, though the majority of texts seem to have n a r (*Die Musik der Sumerischen Kultur* (Frankfurt am Main, 1960), p. 87 n. 6). Note that M. Lambert refers to these as the "seven obligatory musical instruments" (*RA* **55** (1961): p. 185 *sub* No. 15). *Cf.* the first seven instruments named in *Shulgi B* (*cf. Ur Excavations—Texts VI* (London, 1963) No. 81 rev. lines 7–11): ^{giš}zà.mí, ^{giš}sa.XXX, ^{giš}al.gar, ^{giš}sa.bí.tum, ^{giš}mi.rí.tum, ^{giš}liliz!.za (or was my *ur.za.ba.bi.tum, *AS* 16 n. 5, correct?), [^{giš}ḪA]R.ḪAR.

II. t i g i . 7 passages

1) *Eridu Hymn* lines 125 f.:
é tigi.7.e si.sá.e nam.šub sum.mu
šìr.kù téšé ki al.du$_{10}$.ge
"House which sets up/performs the t i g i . 7 (-music), (and) which gives forth the magic spells;
(with) holy song(s) (in) unison, the house that makes good the land."
[Note the following passages for t é š "unison" playing/singing: *PBS* 1/1, no. 11, iv, 84 (= *ištēniš*, iii, 52); ED LÚ, *MSL XII*, p. 14, l. 20: read té š-d v$_{12}$; *TCS* III. p. 17, l. 8: šìr-téš-gal-zu "your great unison song" (correction of Sjöberg's reading, courtesy W. J. Heimpel), in context describing large temple orchestras and full choruses that perform amidst feasting and other entertainment.]

2) *Shulgi B* (A. Falkenstein, *ZA* **50** (1949): pp. 61–91; S. N. Kramer in *The Ancient Near East, Supplementary Texts and Pictures*, J. B. Pritchard, ed. (Princeton, 1969), pp. 584–586) line 81: n a r . m u tigi.7.e šìr ḫa.ma.an.ne.eš
"My singers sang songs for me in the t i g i - 7 manner."
[Note Kramer's translation: "My minstrels sang for me the seven tigi-songs."]

3) *Keš Temple Hymn* (G. Gragg, in Å. Sjöberg, *Texts from Cuneiform Sources III* (Locust Valley, N. Y., 1969), pp. 155–188) line 89: é nun.e ki.gar.ra tigi.da ár.ra [ ]

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Sumerian musicological traditions may reach. Again it is the lexical texts that give us reason to believe in the high age of the traditions, for from as early as the middle of the third millennium B.C., we have the Early Dynastic lists of professions ("Early Dynastic Lú") which provide us with the core of the musicological terms for singers and instrumentalists; by the Old Babylonian period, this same species of Sumerian and Akkadian texts (especially Proto-Lú and the canonical LÚ = *ša*) offer us nearly 100 terms concerning musicians and musicology, the closely related cult personnel, and entertainers.[78]

It is an understatement to say that we have only opened a door on Mesopotamian musical theory, and that we can but peek inward through a small cluster of meaningful terms. I am hopeful that continued Assyriological research will supply the musicologists with an enlarged body of technical terms. The necessity of cooperation between the two disciplines is abundantly clear.

"Temple founded by the prince who . . . with the t i g i."
Note that text A has a variant reading NAM.IMIN(7).NI-da for t i g i . d a (*ibid.*, p. 173 note to line 89).

III. t i g i passages

1) *Shulgi A* (Falkenstein, *op. cit.*) line 54:
t i g i . n ì . d u$_{10}$. g e s i ḫ a . b a . n i . s á
"I let the *good tigi(-music)* be performed there."
Note Falkenstein's translation: "tigi-Instrumente liess ich frohe Weisen spielen." (*ibid.*, p. 69)

2) Compare Falkenstein's treatment of Gudea Cyl. B X 9–11 (A. Falkenstein, *Sumerische und Akkadische Hymnen und Gebete* (Zürich, 1953), p. 174):

t i . g i$_4$. n ì . d u$_{10}$. g e s i . s á . a . d a
k i s a l . é . n i n n u ḫ ú l . a s i . a . d a

"Dass die Pauke, die gute, recht gespielt werde, das sich der Hof des Eninnu mit Freude fülle."

3) *VAS* II 4 rev. i 27–32 (Å. Sjöberg, *Der Mondgott Nanna-Suen I* (Stockholm, 1960), pp. 97–101):

k i . s á . a l . m a . ḫ e n i n d a . b a . g á . r a . z u
t i . g i . n i$_5$ ⟨. i n⟩ . d u . g e s i ḫ a . p à . n e . s á
u m . m i . n a . n a t i . g i m u . r a . a n . d u
^{d}n a n n a k i . s á . a l . m a . ḫ e n i n d a . b a . g á . r a . z u
t i . g i . n i$_5$. i n . d u . g e s i ḫ a . p à . n e . s á
u m . m i . n a . n a t i . g i m u . r a . a n . d u
"Dein grosser Vorhof, in dem dein Brot (als Opfer) hingesetzt ist,
lässt dort die Pauke schöne Lieder spielen,
in der hohen (Götter)versammlung lässt man dir die Pauke ertönen.
Nanna, dein grosser . . . (etc.)."

Compare, once again, Falkenstein's translation of the pertinent line: lässt dort die Pauken 'des Guten' ertönen" (*ZA* **50**: p. 86).

4) *Keš Temple Hymn* lines 113–117:

p a$_4$. š e š . e . n e k u š m u . u n . s ì g . g e . n e
é . š u b u r u . š u b (. a) m u . n i . i n . b é . e . n e
s i . a m . m a . k e$_4$ g ú m . g a m i . n i . i b . z a
$^{gi\check{s}}$a l . g a r . s u r$_x$. r a s ù ḫ . s a ḫ$_4$ m i . n i . i b . z a
t i g i n u n . d u$_{10}$. g e m u . n a . d u$_{12}$. a

"The *pāšišu*-priests beat on the (drum-)skin,
they recited the é . š u b and u r u . š u b (verses);
the bull's horn kept making the sound *gum-ga*,
the drumsticks/plectrums(?) kept making the sound *suḫ-saḫ*,
a t i g i *for the good prince* was played."

In view of the syllabically-written VAS II 4 variant *ni$_5$-in* for the more common *nì*, may we see in the t i g i n u n . d u$_{10}$. g e of the *Keš Temple Hymn* line a simple variant of the much more frequent expression t i g i . n ì . d u$_{10}$. g e and translate all occurrences, therefore, as "good tigi(-music)"? (For further instances of t i g i . n ì . d u$_{10}$, see Å. Sjöberg, *op. cit.*, p. 101 n. 2.)

IV. The Number Seven
If one may, with Aaron Shaffer, translate Sumerian d i . d a < d i . d u$_{11}$ as "music," then the following passage (a report on the shades in the Netherworld) may be used to reveal an association of the number seven with music in general:

l ú d u m u . n i 7 . à m i g i b í (. i n) . d u$_8$. a m i g i
b í . d u$_8$ . . à m a . n a . g i m a n . a k a
d u b . ú š . d i n g i r . r e . e . n e . k a $^{gi\check{s}}$g u . z a
í b . t u š d i . d a g i š b a . t u k u

"Did you see him who had seven sons?" "I saw." "How does he fare?"
"As a companion of the gods he sits on a chair and listens to music."

(*Gilgamesh, Enkidu, and the Netherworld* 267–268, in Aaron Shaffer, *Sumerian Sources of Tablet XII of the Epic of Gilgamesh.* Doctoral Dissertation, University of Pennsylvania, 1963. (University Microfilms 63–7085)

Note E. Gordon, *Sumerian Proverbs* (Philadelphia, 1959), p. 129: d i (. d i) "to play/sound (the b a l a g)"; also J. J. A. van Dijk, *Sumerische Götterlieder II*, Abh. der Heidelberger Akademie der Wiss., Phil.—hist. Klasse **1960/1** (Heidelberg, 1960), p. 50: t i g i z a . a m . z [a . a] m k i . d i . b i "wo Pauke (und) zamzam-Instrument erklingen."

See also footnote 62 for discussion of several other Sumerian terms concerned with music.

I take this opportunity to thank our very capable student, Daniel A. Foxvog, *Cand. Phil.*, for his assistance with the Sumerian material utilized in this article, and for his help in preparing this manuscript.

[78] This material is now published in *Materials for the Sumerian Lexicon XII: A Reconstruction of Sumerian and Akkadian Lexical lists* (Rome, 1969). Note especially the Sumerian terms in Old Babylonian Proto-Lu, lines 587–662.

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Following is a list of abbreviations used in the footnotes:

AHw Wolfram von Soden, *Akkadisches Handwörterbuch* (Wiesbaden, 1959–).

AS 16 *Studies in Honor of Benno Landsberger*, The Oriental Institute of the University of Chicago, Assyriological Studies No. 16 (Chicago, 1965).

CAD *The Assyrian Dictionary of the Oriental Institute of the University of Chicago* (Chicago, 1964–).

CT *Cuneiform Texts from Babylonian Tablets in the British Museum* (London, 1896–).

KAR E. Ebeling, *Keilschrifttexte aus Assur religiösen Inhalts*, Wissenschaftliche Veröffentlichungen der deutschen Orient-Gesellschaft **28** & **34** (Leipzig, 1919 & 1923).

RA *Revue d'Assyriologie et d'archeologie orientale* (Paris, 1884–).

RM *Revue de Musicologie* (Paris, 1917–).

ZA *Zeitschrift für Assyriologie und vorderasiatische Archäologie* (Berlin, 1886–).

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